

P a t e n t c l a i m s

1.

A method for individually transporting articles of different type, size, weight, material
5 or shape, to one delivery location of a plurality of delivery locations that is designated
for the respective article,

characterised by

- placing the articles one by one in respective transport containers; and
- causing a respective article at a desired, respective delivery location to be transferred
10 from its transport container to a collecting or storage bin, disintegrator or further
conveyor dedicated to the article;
- the transport container at the designated delivery location being caused to
discharge the article from the container under the effect gravity or with the aid of
a separate, controlled actuating means; and
- 15 - identifying the respective article at least as regards its material type, prior to it being
placed in a transport container.

2.

A method according to claim 1, characterised in

- 20 - that the transport container is a partly open container, e.g., bucket-shaped or trough-
shaped, in order that, at the delivery location designated for an article placed therein, it
can be made to invert about an axis of rotation so as to discharge the article under the
effect of gravity.

25 3.

A method according to claim 1, characterised in

- that the inversion takes place through an angle of 360°.

4.

30 A method according to claim 1, characterised by

- causing the transport container at the designated delivery location to turn about two
axially aligned bearing pins.

5.

35 A method according to claim 2, characterised by

- allowing the rotation of the transport container in a controllable manner to be
temporally actuated by force.

6.

A method according to claim 1 or 2, characterised by

- allowing the transport containers to move in a circular path of movement with the axis
5 of rotation of adjacent containers spaced apart at a fixed distance.

7.

A method according to one or more of the preceding claims,
characterised by

- 10 - allowing the transport containers to move along the circular path as an endless,
moving row of containers.

8.

A method according to one or more of the preceding claims,
15 characterised in

- that the circular path has both horizontal and vertical portions.

9.

A method according to one or more of the preceding claims,
20 characterised by

- moving the transport containers along the path using a chain or line.

10.

A method according to claim 9, characterised in

- 25 - that the transport containers are moved by means of a synchronously moving pair of
chains or lines.

11.

A method according to claim 9 or 10, characterised in

- 30 - that the bearing pins of the containers are supported in holders on the respective chain
or line.

12.

A method according to one of claims 7 – 10, characterised by

- 35 - causing the transport containers to not rotate in horizontal portions of the circular path
by allowing guide pins on both sides of the container to form anti-rotation supports.

13.

A method according to claim 1 or 2, characterised in

- that the rotation is controlled by a plurality of guide pins, where at least one of the guide pins, on cooperation with a moving guide flap mounted at the delivery point,
5 causes an initial turning of the container, and where at least one further guide pin in cooperation with a toothed engaging element causes controlled rotation of the container.

14.

A method according to one or more of the preceding claims,

10 characterised in

- that the transport containers move at a constant speed along the transport path.

15.

A method according to one or more of the preceding claims,

15 characterised in

- that the articles are empty packaging units, e.g., cans of metal or plastic, or bottles of plastic or glass.

16.

20 A method according to one or more of the preceding claims,
characterised in

- that the transport containers are inspected by a television camera to determine at least one of the following features: that just one article is in the dedicated transport container, that the transport container is emptied at the desired article delivery location,
25 that the article is not a strange article, and that the article is in a unitary state.

17.

A device for individually transporting articles of different type, size, weight, material or shape to one delivery location of a plurality of delivery locations that is designated for
30 the respective article, characterised by

- a plurality of transport containers arranged to move in spaced apart relation along a circular transport path as an endless, moving row of containers, each designed to hold just one single article;
- a means for identifying each article at least as regards its material type prior to a
35 location at which packaging units can be placed singly in respective transport containers; and

- an actuating means mounted at each delivery location in order in activated position related to an identified article, to cooperate with a respective transport container so as to remove the identified article in the container from the container at its designated delivery location, said actuating means in an inactive position being designed to
5 selectively allow a container to pass the delivery location or locations to which it is not related without being actuated.

18.

A device according to claim 17, characterised in

- 10 - that the transport container is a partly open container, e.g., bucket-shaped or trough-shaped; and
- that the transport container at a delivery location designated for an article placed therein is arranged to cooperate with a means at the delivery location for inverting the transport container about an axis of rotation thereof so as to discharge the article under
15 the effect of gravity.

19.

A device according to claim 17, characterised in

- 20 - that the transport container is arranged at a designated delivery location for an article to turn about two axially aligned bearing pins.

20.

A device according to claim 19, characterised in

- 25 - that the rotation of the transport container is in a controllable manner temporally actuated.

21.

A device according to claim 19 or 20, characterised in

- 30 - that the transport containers are arranged to move in a circular path of movement with the axis of rotation of adjacent containers spaced apart at a fixed distance.

22.

A device according to one or more of preceding claims 17-21, characterised in

- 35 - that the transport containers are arranged to move along the circular path in an endless, moving row.

23.

A device according to one or more of preceding claims 17-22, characterised in

- that the circular path has both horizontal and vertical portions.

5

24.

A device according to one or more of preceding claims 17, 21, 22 and 23, characterised in

- that the transport containers are movable along the path by means of a chain or line.

10

25.

A device according to claim 24, characterised in

- that the transport containers are movable with the aid of a synchronously moving pair of chains or lines.

15

26.

A device according to claim 24, characterised in

- that the bearing pins of the containers are supported in holders on the respective chain or line.

20

27.

A device according to one of claims 22-26, characterised in

- that the transport containers have guide pins on both sides of the container which form anti-rotation supports in at least parts of the horizontal portions of the circular path.

25

28.

A device according to claim 17 or 18, characterised by

- a plurality of guide pins for controlling the rotation of the transport container, wherein at least one of the guide pins is arranged, upon cooperation with a moving guide flap located at the delivery location, to cause an initial turning of the container, and wherein at least one additional guide pin is designed in cooperation with a toothed engaging element to effect controlled rotation of the transport container.

30

29.

A device according to one or more of preceding claims 17-28, characterised in

35

- that the transport containers move at a constant speed along the transport path.

30.

A device according to one or more of preceding claims 17-29,

5 characterised in

- that the transport containers are designed to receive articles in the form of empty packaging units, e.g., cans of metal or plastic, or bottles of plastic or glass.

31.

10 A device according to one or more of the preceding claims,
characterised in

- that a television camera is placed above the movement path of the transport containers to cooperate with an article recognition means in order to establish at least one of the following features: that only one article is in the dedicated transport container, that the transport container is emptied at a desired article delivery location, that the article is not
15 a strange article, and that the article is in a unitary state.

32.

A device according to one or more of claims 17-31,

20 characterised in

- that at the delivery locations there is provided a dedicated collecting or storage bin, disintegrator or further conveyor.

33.

25 A device according to claim 24 or 25, characterised in

- that the chains or lines are driven by two rigidly connected, powered drive wheels around which the chains or lines are partly run; and
- that said holders on the chains or lines are designed for successive cooperation with corresponding recesses in respective guide wheels.